B1

irradiating a semiconductor laser light onto said optical disk through said [diamond-like carbon] hard-carbon coating;

wherein the number of pin-holes in said [diamond-like carbon] hard-carbon coating is 30/mm^2 or less.

3. (Amended) A method according to claim 1 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

B2

4. (Amended) A method according to claim 1 wherein film quality of said [diamond-like carbon] hard-carbon coating is measured in accordance with Raman spectroscopy.

5. (Amended) A method according to claim 1 wherein the thickness of said [diamond-like carbon] hard-carbon coating is 50Å or more.

6. (Amended) A method according to claim 1 wherein said [semiconductor laser light has a wavelength of 700 to 800 nm] hard-carbon coating contains hydrogen.

Sub C2

8. (Amended) A method for operating an optical disk memory comprising the steps of:

B3

introducing an optical disk having a surface protected by a protective film comprising a [diamond-like carbon] hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through said [diamond-like carbon] hard-carbon coating;

wherein the number of pin-holes in said [diamond-like carbon] hard-carbon coating is 30/mm^2 or less;

B3

wherein said [diamond-like carbon] hard-carbon coating contains at least one of element selected from the group ~~consisting of Si, B, N, P and F~~.

10. (Amended) A method according to claim 8 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

11. (Amended) A method according to claim 8 wherein film quality of said [diamond-like carbon] hard-carbon coating is measured in accordance with Raman spectroscopy.

B4

12. (Amended) A method according to claim 8 wherein the thickness of said [diamond-like carbon] hard-carbon coating is 50Å or more.

13. (Amended) A method according to claim 8 wherein [said semiconductor laser light has a wavelength of 700 to 800 nm] a concentration of said element is 20 atomic% or less.

14. (Amended) A method according to claim 8 wherein said [semiconductor laser light is a visible light] hard-carbon coating contains hydrogen.

Sub C3

15. (Amended) A method for operating an optical disk memory comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a [diamond-like carbon] hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said

B4

[diamond-like carbon] hard-carbon coating;

wherein the number of pin-holes in said [diamond-like carbon] hard-carbon coating is 30/mm^2 or less.

17. (Amended) A method according to claim 15 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

B5

18. (Amended) A method according to claim 15 wherein film quality of said [diamond-like carbon] hard-carbon coating is measured in accordance with Raman spectroscopy.

19. (Amended) A method according to claim 15 wherein the thickness of said [diamond-like carbon] hard-carbon coating is 50Å or more.

20. (Amended) A method according to claim 15 wherein said [semiconductor laser light has a wavelength of 700 to 800 nm] hard-carbon coating contains hydrogen.

SUB C4

22. (Amended) A method for operating an optical disk memory comprising the steps of:

B6

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a [diamond-like carbon] hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said [diamond-like carbon] hard-carbon coating;

wherein the number of pin-holes in said [diamond-like carbon] hard-carbon coating is 30/mm^2 or less;

B5

wherein said [diamond-like carbon] contains at least one of element selected from the group consisting of Si, B, N, P and F.

24. (Amended) A method according to claim 22 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

25. (Amended) A method according to claim 22 wherein film quality of said [diamond-like carbon] hard-carbon coating is measured in accordance with Raman spectroscopy.

B6

26. (Amended) A method according to claim 22 wherein the thickness of said [diamond-like carbon] hard-carbon coating is 50Å or more.

27. (Amended) A method according to claim 22 wherein [said semiconductor laser light has a wavelength of 700 to 800 nm] a concentration of said element is 20 atomic% or less.

28. (Amended) A method according to claim 22 wherein said [semiconductor laser light is a visible light] hard-carbon coating contains hydrogen.

Sub C5

29. (Amended) A method for operating an optical disk memory comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a [semiconductor] laser light having an wavelength of 700 to 800 nm onto said optical disk through said hard-carbon coating ;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or

B6 ~~less.~~ C

B7 31. (Amended) A method according to claim 29 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

B8 34. (Amended) A method according to claim 29 wherein said [semiconductor laser light has a wavelength of 700 to 800 nm] hard-carbon coating contains hydrogen.

B9 SUB C6 36. (Amended) A method for operating an optical disk memory comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a [semiconductor] laser light having an wave length of 700 to 800 nm onto said optical disk through said hard-carbon coating ;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

B10 38. (Amended) A method according to claim 36 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

B11 41. (Amended) A method according to claim 36 wherein [said semiconductor laser light has a wavelength of 700 to 800 nm] a concentration of said element is 20 atomic% or less.

42. (Amended) A method according to claim 36 wherein said [semiconductor laser light is a visible light] hard-carbon coating contains hydrogen.

SUB C7

43. (Amended) A method for operating an optical disk memory comprising the steps of:

B11

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a [semiconductor] laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating ;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

B12

45. (Amended) A method according to claim 43 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

B13

48. (Amended) A method according to claim 43 wherein said [semiconductor laser light has a wavelength of 700 to 800 nm] hard-carbon coating contains hydrogen.

SUB C8

50. (Amended) A method for operating an optical disk memory comprising the steps of:

B14

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a [semiconductor] laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating ;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

B14

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

C

B15

52. (Amended) A method according to claim 50 wherein said [optical disk memory is a compact disk] hard-carbon coating comprises a diamond-like carbon.

55. (Amended) A method according to claim 50 wherein [said semiconductor laser light has a wavelength of 700 to 800 nm] a concentration of said element is 20 atomic% or less.

11

56. (Amended) A method according to claim 50 wherein said [semiconductor laser light is a visible light] hard-carbon coating contains hydrogen.

B16

Please add the following new claims:

Sub C9

--57. A method for operating an optical disk memory comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

C

58. A method for operating an optical disk memory comprising the steps

of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

B16

59. A method for operating an optical disk memory comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

60. A method for operating an optical disk memory comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

61. A method according to claims 57 and 58, wherein said protective film is formed on the surface of said optical disk without heating.

62. A method according to claims 59 and 60, wherein said protective film is formed on the surface of said substrate without heating.

63. A method according to claims 57 to 60, wherein said hard-carbon coating comprises a diamond-like carbon.

B14

64. A method according to claims 57 to 60, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

65. A method according to claims 57 to 60, wherein the thickness of said hard-carbon coating is 50Å or more.

66. A method according to claims 57 to 60, wherein said hard-carbon coating contains hydrogen.

67. A method according to claims 58 and 60, wherein a concentration of said element is 20 atomic% or less.

Sub C10

68. A method of operating an optical magnetic disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through

said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

69. A method of operating an optical magnetic disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

B16

70. A method of operating an optical magnetic disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

71. A method of operating an optical magnetic disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film

comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

SUB C16

72. A method according to claims 68 and 69, wherein said protective film is formed on the surface of said optical disk without heating.

B16

73. A method according to claims 70 and 71, wherein said protective film is formed on the surface of said substrate without heating.

74. A method according to claims 68 to 71, wherein said hard-carbon coating comprises a diamond-like carbon.

75. A method according to claims 68 to 71, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

76. A method according to claims 68 to 71, wherein the thickness of said hard-carbon coating is 50Å or more.

77. A method according to claims 68 to 71, wherein said hard-carbon coating contains hydrogen.

78. A method according to claims 69 and 71, wherein a concentration of said element is 20 atomic% or less.

SUB E11

79. A method of operating an optical magnetic disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

80. A method of operating an optical magnetic disk comprising the steps of:

B16

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

81. A method of operating an optical magnetic disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

82. A method of operating an optical magnetic disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

B16 Sub C1

83. A method according to claims 79 and 80, wherein said protective film is formed on the surface of said optical disk without heating.

84. A method according to claims 81 and 82, wherein said protective film is formed on the surface of said substrate without heating.

85. A method according to claims 79 to 82, wherein said hard-carbon coating comprises a diamond-like carbon.

86. A method according to claims 79 to 82, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

87. A method according to claims 79 to 82, wherein the thickness of said hard-carbon coating is 50Å or more.

88. A method according to claims 79 to 82, wherein said hard-carbon coating contains hydrogen.

89. A method according to claims 80 and 82, wherein a concentration of said element is 20 atomic% or less.

Sub E11

90. A method of operating an optical magnetic disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

B16

91. A method of operating an optical magnetic disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

92. A method of operating an optical magnetic disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon

coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

93. A method of operating an optical magnetic disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

B16

SUB C12

94. A method according to claims 90 and 91, wherein said protective film is formed on the surface of said optical disk without heating.

95. A method according to claims 92 and 93, wherein said protective film is formed on the surface of said substrate without heating.

96. A method according to claims 90 to 93, wherein said hard-carbon coating comprises a diamond-like carbon.

97. A method according to claims 90 to 93, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

98. A method according to claims 90 to 93, wherein the thickness of

said hard-carbon coating is 50Å or more.

99. A method according to claims 90 to 93, wherein said hard-carbon coating contains hydrogen.

C

100. A method according to claims 91 and 93, wherein a concentration of said element is 20 atomic% or less.

101. A method of operating a compact disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

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102. A method of operating a compact disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

SUB E14

103. A method of operating a compact disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film

comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

104. A method of operating a compact disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less;

B16

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

SUB C13

105. A method according to claims 101 and 102, wherein said protective film is formed on the surface of said optical disk without heating.

106. A method according to claims 103 and 104, wherein said protective film is formed on the surface of said substrate without heating.

107. A method according to claims 101 to 104, wherein said hard-carbon coating comprises a diamond-like carbon.

108. A method according to claims 101 to 104, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

109. A method according to claims 101 to 104, wherein the thickness of said hard-carbon coating is 50Å or more.

110. A method according to claims 101 to 104, wherein said hard-carbon coating contains hydrogen.

111. A method according to claims 102 and 104, wherein a concentration of said element is 20 atomic% or less.

SUB E15

112. A method of operating a compact disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

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113. A method of operating a compact disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

114. A method of operating a compact disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic

material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

115. A method of operating a compact disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less;

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wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

SUB C1A

116. A method according to claims 112 and 113, wherein said protective film is formed on the surface of said optical disk without heating.

117. A method according to claims 114 and 115, wherein said protective film is formed on the surface of said substrate without heating.

118. A method according to claims 112 to 115, wherein said hard-carbon coating comprises a diamond-like carbon.

119. A method according to claims 112 to 115, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

120. A method according to claims 112 to 115, wherein the thickness of said hard-carbon coating is 50Å or more.

121. A method according to claims 112 to 115, wherein said hard-carbon coating contains hydrogen.

C

122. A method according to claims 113 and 115, wherein a concentration of said element is 20 atomic% or less.

SUB B1 123. A method of operating a compapct disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

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B16

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

SUB E16 124. A method of operating a compact disk comprising the steps of:

introducing an optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

125. A method of operating a compact disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic

material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

126. A method of operating a compact disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon coating;

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wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

SUB C15

127. A method according to claims 123 and 124, wherein said protective film is formed on the surface of said optical disk without heating.

128. A method according to claims 125 and 126, wherein said protective film is formed on the surface of said substrate without heating.

129. A method according to claims 123 to 126, wherein said hard-carbon coating comprises a diamond-like carbon.

130. A method according to claims 123 to 126, wherein film quality of said hard-carbon coating is measured in accordance with Raman

spectroscopy.

131. A method according to claims 123 to 126, wherein the thickness of said hard-carbon coating is 50Å or more.

132. A method according to claims 123 to 126, wherein said hard-carbon coating contains hydrogen.

133. A method according to claims 124 and 126, wherein a concentration of said element is 20 atomic% or less.

B16 Sub E17 134. A method of an optical disk comprising the steps of:

introducing said optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

135. A method of operating an optical disk comprising the steps of:

introducing said optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

136. A method of operating an optical disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less.

137. A method of operating an optical disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a semiconductor laser light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is 30/mm^2 or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

B16

SUB C16

138. A method according to claims 134 and 135, wherein said protective film is formed on the surface of said optical disk without heating.

139. A method according to claims 136 and 137, wherein said protective film is formed on the surface of said substrate without heating.

140. A method according to claims 134 to 137, wherein said hard-carbon coating comprises a diamond-like carbon.

141. A method according to claims 134 to 137, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

142. A method according to claims 134 to 137, wherein the thickness of said hard-carbon coating is 50Å or more.

143. A method according to claims ~~134~~ to 137, wherein said hard-carbon coating contains hydrogen.

144. A method according to claims 135 and 137, wherein a concentration of said element is 20 atomic% or less.

B16 Sub C18 145. A method of operating an optical disk comprising the steps of:

introducing said optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

146. A method of operating an optical disk comprising the steps of:

introducing said optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less,

wherein said hard-carbon coating contains at least one of element

selected from the group consisting of Si, B, N, P and F.

147. A method of operating an optical disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

148. A method of operating an optical disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a laser light having an wave length of 700 to 800 nm onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

B16

SUB C17

149. A method according to claims 145 and 146, wherein said protective film is formed on the surface of said optical disk without heating.

150. A method according to claims 147 and 148, wherein said protective film is formed on the surface of said substrate without heating.

151. A method according to claims 145 to 148, wherein said hard-

carbon coating comprises a diamond-like carbon.

152. A method according to claims 145 to 148, wherein film quality of said hard-carbon coating is measured in accordance with Raman spectroscopy.

153. A method according to claims 145 to 148, wherein the thickness of said hard-carbon coating is 50Å or more.

154. A method according to claims 145 to 148, wherein said hard-carbon coating contains hydrogen.

155. A method according to claims 146 and 148, wherein a concentration of said element is 20 atomic% or less.

B\(\phi\) SUB E1a

156. A method of operating an optical disk comprising the steps of:

introducing said optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

157. A method of operating ~~an~~ optical disk comprising the steps of:

introducing said optical disk having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said optical disk through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less,

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

158. A method of operating an optical disk comprising the steps of:

introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less.

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159. A method of operating an optical disk comprising the steps of:

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introducing a substrate made of an organic resin or an industrial plastic material, said substrate having a surface protected by a protective film comprising a hard-carbon coating having a thickness of 500Å or less;

irradiating a visible light onto said substrate through said hard-carbon coating;

wherein the number of pin-holes in said hard-carbon coating is $30/mm^2$ or less;

wherein said hard-carbon coating contains at least one of element selected from the group consisting of Si, B, N, P and F.

SUB C18

160. A method according to claims 156 and 157, wherein said protective film is formed on the surface of said optical disk without heating.

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161. A method according to claims 158 and 159, wherein said protective film is formed on the surface of said substrate without heating.